

What I claim my invention is:

I. Electronic technology which has been especially developed to work within the incentive spirometer, that will help the patient by providing simulated audible, verbal, human sounding voices, thus providing instructions, prompting appropriate usage according to therapeutic time schedules, correcting and encouraging patient performance, as well as, giving the appropriate measurement, that the person or patient has performed with the apparatus, eliminating human visual error, help assist the blind and the visually impaired, though the use of today's state of the art equipment, that can produce electronic intelligence within the apparatus at a low cost, thus reducing patients recovery time and complications,

1) a method of providing audibly and verbally, instruction and guidance, to help perform the therapeutic sessions by the patient to improve lung performance, which through medical studies has shown that very few patients perform the required therapy as suggested though the accompanied literature, but through the usage of the present invention, the percentage in regards to lung problems occurring due to failure of patient usage of the Incentive Spirometer, will decrease dramatically as the present invention will nag or prompt the patient without stopping, until the patient uses the apparatus and will not stop until the time interval necessary to fulfill the patient's therapeutic need has been accomplished. Through electronic intelligence, the present invention, will prompt the patient to use the medical apparatus, as well as, guide the patient through the proper steps of using said medical apparatus, thus quicker patient recovery will be achieved, through compliance without complication,

2) replacing the normal human visual readings or measurements, eliminating human error of inaccurate readings, due to the prior required float recognition which is imperative to provide visual measurement, since the float doesn't stay always in position long enough to read properly and has to be constantly viewed during therapeutic sessions to observe the exact reading of measurement, with a human sounding electronically programmed voice or voices giving the same readings or measurements as deemed necessary to provide the sighted, as well as the visually impaired patient, with adequate information, to fulfill the patient's therapeutic regiment for recovery and allowing the blind to hear and respond, to the full operation of the therapeutic regiment, of the present invention;

3) a medical apparatus that because of the inexpensive construction, is comparable to the same concept, in relationship to therapeutic use, as the expensive apparatus, due to today's advanced technology. This breakthrough in modern technology allows the patient to afford the new improved apparatus of the present invention, which basically supplies all of the same healthcare purposes in relationship to the therapy of the apparatus, however, it also gives the patient the advantage of hearing the therapeutic guidance and measurements as an added benefit and cost is virtually the same as most disposable incentive spirometry units;

II. A new method to provide the above function of the present invention through the following electronic technology:

1) a number of the following electronic components in order to provide the function as above claimed:

- (a) one or more electronic sensors producing an output signal,
- (b) one or more electronic modules that convert said sensor output signal (s) into digital format,
- (c) one or more electronic modules that includes but is not limited to a central processing unit,
- (d) one or more electronic modules for digital storage of program instructions and data,
- (e) one or more electronic modules for digital storage of digital audio sound data,
- (f) one or more electronic modules for generation of audible sound,
- (g) one or more electronic modules for managing and conserving electrical power,
- (h) one or more electronic modules for determining accurate intervals of time,
- (i) one or more electronic modules for communicating remotely with separate agent,

2) said method of new apparatus capable of measuring output signal of the sensors, converting said output signals into digital format to be stored and processed by the central processing unit, resulting in actions taken by the central processing unit under direction of its digital program instructions in accordance to its pre-determined set of actions,

3) said pre-determined actions of the digital program instructions include but not limited to the generation of audible audio sound sequences that provide information relating to said output signals,

4) said electronic sensors capable of measuring but not limited to parameters of performance of the human body in various settings relating to medical therapeutic performance, or physical training,

4a) said electronic sensors being comprised of, but not limited to, a resistor that forms a variable resistance to electric current flow, such as a film of carbon, but not limited to, that forms a resistance to electric current flow, in contact with said resistor,

5) said central processing unit capable of performing tasks as specified in the order defined in digital program, including, but not limited to processing of sensor output signals, execution of control functions defined by the digital program, providing actions in accordance to accurate time intervals, generation of audible sound,

- 6) said digital program defines control functions that implement therapy or physical rehabilitation regimes,
- 7) said digital program defining control functions that implement tasks for managing and conserving electrical power,
- 8) said digital program defining control functions that implement tasks for determining accurate intervals of time,
- 9) said digital program defining control functions that implement tasks for determining time of day, (for those medical apparatus that need to be turned on or off to begin or end therapeutic sessions),
- 10) said digital program defining control functions that implement tasks for communicating with a separate agent,
- 11) said digital program being stored in memory within the electronic module that contains the central processing unit, and or being stored in memory that is not within the electronic module that contains the central processing unit but that is accessible by the central processing unit,
- 12) said digital audio sound data being stored in memory within the electronic module that contains the central processing unit, and or being stored in memory that is not within the electronic module that contains the central processing unit but that is accessible by the central processing unit,
- 13) directory table containing descriptive information about those commands, responses, measurements, or words as aforementioned about said digital audio sound data that is stored in memory within the electronic module that contains the central processing unit, or being stored in memory that is not within the same electronic module that contains the central processing unit but that is also accessible to the central processing unit,
- 13a) said digital audio sound data being arranged into multiple units, each unit representing an audible verbal message comprised of a series of words as programmed per the requirements in synthesis with the medical apparatus's therapeutic use,
- 13b) a method for retrieving and generating the audible sound representing the digital audio data from the start of the message to the end of the message as corresponds to the therapeutic dialogue needed,

13c) a method for retrieving and generating the audible sound representing the digital audio data from an intermediate point in the message to a subsequent intermediate point in the same message, to allow the medical apparatus to respond to the measurements being produced by the patient accordingly and guide the patient according to the measurement amount,

14) said electronic module for generation of audible sound being the same electronic module that contains the central processing unit, and or a being separate electronic module for the module that contains the processing unit,

15) said electronic module for generation of audible sound including a module that converts digital audio data into continuous analog signal that is amplified to increase the signal power as needed to create audible sound from sound generating modules such as, but not limited to, speakers,

15a) said electronic modules for generation of audible sound providing a sound generating a continuous analog signal that is one half the value of the maximum signal level, such level representing zero sound to be generated,

15b) said electronic module for generation of audible sound providing a sound generating module such , but not limited to, speaker(s) that is capable of receiving a level that is one half the maximum signal level in a way that produces no sound and consumes little or no power,

15c) said sound generating module such as, but not limited to, a speaker(s) whose reference signal level is set at one half the maximum signal level such that it produces no sound when it receives such a signal level,

15d) said sound generating module being provided a reference signal level set at on half the maximum signal level by connecting it between a series of batteries in a way that provides a reference signal that is exactly on half the signal level that is produced by the above said batteries connected in this way,

16) said digital program defining a method for determining the value of a sensor output signal, generating an audible verbal response according to a pre-determined set of controls and functions as described herein, in order to provide instructional information to the operator of whatever medical apparatus is being used for instructional information or guidance,

17) said digital program defining a set of pre-determined set of controls and functions relating sensor output signals to audible verbal commands, responses and measurements, comprises of improving medical conditions of the patient through the use of the said medical apparatus accordingly, along with the present invention.